

REMARKS

Claims 1, 3-5, 7-9, 11-14, 17-21 were pending, all of which were rejected. No amendments are made herein. Reconsideration is requested.

Claim Rejections – 35 U.S.C. §103

Claims 1, 3, 9, 11, 14, and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Aspnes et al (6,134,012) (“Aspnes”) in view of Woollam et al. (5,373,359) (“Woollam”). Reconsideration is respectfully requested.

The Examiner stated that regarding independent Claim 1, 9, and 14 Aspnes “discloses a broadband spectroscopic rotating compensator ellipsometer which has all the features of the present invention except that light source is a pulsed light source for generating a pulsed light beam”. Applicant respectfully disagrees.

Applicant notes that the Examiner considers the rotating compensator 68 in Aspnes a “variable phase retarder.” A rotating compensator, however, is not a “spatially dependent polarizing element” as is claimed in Claim 1 and similarly recited in Claims 9 and 14. As is well known in the art, a compensator changes the phase of an incident wave by delaying one of the two orthogonal light constituents. Aspnes, for example, states “The compensator is an optical component that delays the light polarized parallel to its slow axis relative to light polarized parallel to its fast axis by an amount proportional to the refractive index difference along the two directions and the thickness of the plate, and inversely proportional to the wavelength of the light.” Col. 2, lines 20-25. The compensator does not vary the phase spatially.

Independent Claim 1 recites “a spatially dependent polarizing element ... that varies the phase of the pulsed electromagnetic beam spatially along a first direction” and “the multi-element detector detects the intensity of the pulsed electromagnetic beam as a function of phase along the first direction and as a function of wavelength along the second direction”. Aspnes fails to teach or suggest a “spatially dependent polarizing element” or detecting the intensity of the beam “as a function of phase along the first direction and as a function of wavelength along the second direction”.

Independent Claim 9 recites “producing a spatially dependent relative phase difference between the electric field components of the pulsed electromagnetic beam in a first direction” and “detecting the intensity of the polarized pulsed electromagnetic beam at a

plurality of positions as a function of the spatially dependent relative phase shift in the first direction and the wavelengths in the second direction". Aspnes fails to teach or suggest a "producing a spatially dependent relative phase difference" or detecting the intensity of the beam "as a function of the spatially dependent relative phase shift in the first direction and the wavelengths in the second direction".

Independent Claim 14 recites "**means for producing a spatially dependent phase shift** ... wherein the phase shift is spatially dependent along a first direction" and "means for measuring the intensity of the polarized phase shifted beam as a function of phase shift in the first direction and as a function of wavelengths in the second direction". Again, Aspnes fails to teach or suggest a "means for producing a spatially dependent phase shift" or detecting the intensity "as a function of phase shift in the first direction and as a function of wavelengths in the second direction".

Additionally, as noted by the Examiner, Aspnes does not disclose the claimed light source. Accordingly, the Examiner cited Woollam as disclosing "the use of a chopper in a spectroscopic ellipsometer for providing a periodically interrupted signal". Applicant points out, however, that Claim 1 recites "**a flash bulb that turns on and off to produce a pulsed electromagnetic beam with multiple wavelengths**". Similarly, Claim 14 recites "**a flash bulb light source**" and Claim 9 recites "turning on and off a broadband electromagnetic beam".

As noted by the Examiner, however, Woollam does not disclose a flash bulb, but instead discloses the use of a "xenon lamp 81" and a "chopper 84". Woollam does **not** disclose the use of a "flash bulb" or "turning on and off a broadband electromagnetic beam".

In addition, Applicant submits that there is no motivation to combine Aspnes and Woollam. The Examiner stated that it would have been obvious to include in "Law [sic, Aspnes] a chopper as taught by Woollam et al for the purpose of providing a pulsed light beam because this is a known way of using chopper in a spectroscopic ellipsometer." Applicant notes, however, that the Examiner's suggested motivation boils down to the proposition that "it would have been obvious because it was known".

It is black letter law that in order to establish a *prima facie* case of obviousness, the Examiner must provide objective evidence to combine references. In re Lee, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002). The case law is clear that "the best defense against hindsight-based obviousness analysis is the rigorous application of the requirement for a showing of a teaching or motivation to combine the prior art references." Ecolochem, Inc. v.

Southern California Edison Company, 227 F.3d 1361 (Fed. Cir. 2000), citing In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1988). Moreover, the case law is clear that simply because the prior art could be modified does not make the modification obvious “unless the prior art suggested the desirability of [such a] modification.” In re Gordon, 733 F.2d 900, 902 (Fed. Cir. 1984).

Applicant submits that the Examiner’s suggested modification of Aspnes to include a chopper based on the premise choppers were known is merely an impermissible hindsight reconstruction of the claims. Accordingly, Applicant asserts that the Examiner has failed to provide a suggestion or motivation to combine Aspnes with Woollam and, accordingly, the Examiner has failed to make a *prima facie* case of obviousness. See, e.g., MPEP §2142.

Accordingly, Applicants submit that Claims 1, 9, and 14 are patentable over the combination of Aspnes and Woollam. Claim 3 depends from Claim 1, Claim 11 depends from Claim 9, and Claim 18 depends from Claim 14 and are therefore patentable for at least the same reasons as the independent Claims.

Claims 4, 5, 7, 8, 12, 13, 17, and 19-21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Aspnes and Woollam and further in view of Law (5,754,296) (“Law”) and Houston et al. (4,931,657) (“Houston”).

Law and Houston fail to make up for the deficiencies of Aspnes and Woollam. For example, neither Law nor Houston teach or suggest the use of a “spatially dependent polarizing element”. Claims 4, 5, and 7-8 depend from Claim 1, Claims 12-13 depend from Claim 9, and Claims 17, 19-21 depend from Claim 14, and thus are allowable for at least the same reasons as the independent Claims.

Moreover, Applicant submits that the Examiner has failed to provide a suggestion or motivation to combine Aspnes and Woollam with Law and Houston. For example, the Examiner noted that Law teaches that the beam expander is after the retarder and stated that it would be obvious “to include in Aspnes a beam expander before the retarder because the device would function in the same manner.” Thus, the Examiner’s motivation is related to moving the beam expander within Law, but is not related to combining Law with Aspnes and Woollam. Accordingly, Applicant asserts that the Examiner has failed to provide a

suggestion or motivation to combine Aspnes and Woollam with Law. Further, Applicant submits that the Examiner's motivation is incorrect. The device would not function in the same way if the beam expander was moved.

Further, while Houston discloses the use of a strobe light 10, this device is used with a video camera 14 that determines the optical characteristics of a traveling web. The use of a strobe light permits an instantaneous illumination of the web as it moves so that the camera vies the web as a substantially stopped frame. Col. 4, lines 51-63. There is no reason that the strobe light and/or the synchronization means from Houston would be combined with an ellipsometer from Aspnes and Woollam which do not move the sample during analysis.

The Examiner's stated it would be obvious to combine in Woollam a synchronizer as taught by Houston et al so that the detector can detect the light only when the light source is turned-on, thus increase the signal to noise ratio." Applicant points that this suggestion is not provided in either Woollam or Houston and, in fact, is not the reason that Houston uses a synchronizing means, as discussed above. Thus, Applicant asserts that without a hindsight based analysis derived from Applicant's disclosure, there is no motivation to combine Aspnes, Woollam and Houston.

Thus, Applicants respectfully submit that Claim 4, 5, 7, 8, 12, 13, 17, and 19-21 are patentable over the combination of Aspnes, Woollam, Law and Houston. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1, 3-5, 7-9, 11-14, 17-21 remain pending. For the above reasons, Applicants respectfully request allowance of all pending claims. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 982-8202.

**Via Express Mail Label No.
EV 652 161 455 US**

Respectfully submitted,



Michael J. Halbert
Attorney for Applicant
Reg. No. 40,633

SILICON VALLEY
PATENT GROUP LLP
2350 Mission College Blvd.
Suite 360
Santa Clara, CA 95054
(408) 982-8200
FAX (408) 982-8210